DOCUMENT RESUME

ED 119 939 RC 009 088

AUTHOR Lee, Betty Arrowood
TITLE A Study of the Academic Achievement of Kindergarten and Non-Kindergarten Children in a Rural School in Appalachia.
PUB DATE Aug 72
NOTE 59p.; M.A. Thesis, East Tennessee State University
AVAILABLE FROM Inter-Library Loan, East Tennessee State University, Johnson City, Tennessee 37601

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage
DESCRIPTORS *Academic Achievement; *Comparative Analysis; Disadvantaged Youth; Early Childhood Education; Grade 3; *Intervention; *Kindergarten; Literature Reviews; Masters Theses; Readiness; *Rural Youth
IDENTIFIERS *Appalachia; Tennessee

ABSTRACT

The study compared the academic achievement of 12 children who had attended a public school kindergarten in a rural school in Appalachia with the academic achievement of 12 children who had not attended public school kindergarten. Criteria for selection of the groups were: they entered first grade in the fall of 1969, had been in the same school for three consecutive years, and were approximately the same age. Instruments used were the "Harper and Row Pre-Reading Test of Scholastic Ability to Determine Reading Readiness" and the "Metropolitan Achievement Test, Primary Battery, Form F". Data were recorded for a three-year period, 1969 to 1972. First grade test scores were used as the dependent variable and the third grade test was used as the independent variable in the analysis of covariance. Findings revealed that at both the first and third grades, the kindergarten group placed above the non-kindergarten group in differences in means. The kindergarten group was primed for first grade, showing a higher mean on the first grade test than the non-kindergarten group. A higher mean on the third grade test was revealed for the kindergarten group. However, there was no significant difference at the 0.05 level of significance between the two groups. (NQ)

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A STUDY OF THE ACADEMIC ACHIEVEMENT OF KINDERGARTEN AND NON-KINDERGARTEN CHILDREN IN A RURAL SCHOOL IN APPALACHIA

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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A Thesis

Presented to

the Graduate Faculty

East Tennessee State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Betty Arrowood Lee

August 1972

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APPROVAL

Betty Arrowood Lee has satisfactorily completed her thesis and the undersigned members of her advisory committee recommend to the Graduate Council that it be accepted in partial fulfillment of the requirements for the Master of Arts degree.

Chairman, Advisory Committee

Dean, School of Graddate Studies

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Chapter 1

INTRODUCTION

At the present time, our society is becoming increasingly aware of the importance and potential power of early childhood education. The schools are becoming more involved in how to utilize the early years in nourishing the later school experiences of our children through continuous learning patterns.

The public's awareness of the importance of good living experience for young children is being expressed in many different ways. Parents are bringing pressures to bear on their communities to provide kindergartens for their five year olds. Legislative groups are being urged to make provisions for more and better group care for young children. The press, both through newspapers and through periodicals, is keeping the topic of early childhood education before its readers.

More and more of the Southern states are beginning to realize the importance of the early childhood years and the loss which may be irretrievable for the large number of children who are deprived of nursery school and kindergarten experiences.

THE PROBLEM

Statement of the Problem

The problem was to determine whether there was a significant difference between the academic achievement of third grade children who

attended a public school kindergarten and the academic achievement of third grade children who had no kindergarten experience prior to entering first grade.

Significance of the Problem

Early childhood education came into the seventies in a position of unprecedented significance. According to authorities in the field, early childhood education has been recognized as one of the foremost issues of the day.

Studies that have been made point out that there is an initial gain in I. Q. after the first formal school experience whether it is a special intervention program, kindergarten, or grade one. However, there is also a body of evidence that shows the gains made by children in preschool programs are sometimes not maintained for more than a year or, at the most, two years, after such special programs have been completed.[1]

The fading of results shown by children who have been in preschool programs has led many researchers to search for possible causes of why this has happened.

Jensen, in his article, questioned the nature of intervention effects. He said,

> There remains the question of the extent to which specific early learning affects cognitive structures which normally do not emerge until six or seven years of age and whether induced gains at an early level of mental development show appreciable transfer to later stages.[2]

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[1]Louise B. Miller, Experimental Variation of Head Start Curricula: A Comparison of Current Approaches (Louisville: Child Development Laboratory, 1970), p. 1.

[2]Arthur R. Jensen, "How Much Can We Boost I. Q. and Scholastic Achievement?" Harvard Educational Review, XXXIX (Winter, 1969), 106.

The first public school kindergarten in the Washington County School System was established in the fall, 1968. There is a need to make a study of this group of kindergarten children to discover whether kindergarten attendance does, in fact, exert a positive effect on academic achievement. In order to determine the effect of kindergarten on the academic achievement of these children, a thorough study of their academic records was made. At the present time, there has been no evaluation of the first kindergarten children in the Washington County School System.

Purpose of the Study

It was the purpose of this study (1) to investigate the academic achievement of twelve children who attended a public school kindergarten; (2) to investigate the academic achievement of twelve children who had no kindergarten experience prior to first grade; and (3) to compare the academic achievement of these two groups at the end of the third grade.

Limitations of the Study

The following limitations were established for this study:

1. This study was limited to third grade students enrolled in King Springs School, Johnson City, Tennessee, for the academic year, 1971-1972.

2. One group in the study was composed of twelve children who were enrolled in the King Springs kindergarten during the academic year 1968-1969; the other group was composed of twelve children who had no kindergarten experience prior to first grade.

3. For the measurement of academic achievement, scores from the Harper & Row Pre-Reading Test of Scholastic Ability to Determine Reading Readiness, and The Metropolitan Achievement Test, Primary Battery, Form F were analyzed for a three year period (1969-1972).

4. The study was confined to the intellectual growth of students as measured by academic achievement.

5. The time period for the study was limited to five months, January, 1972 through May, 1972.

6. The search for related literature was restricted to books and periodicals on file in the library at East Tennessee State University, and books and periodicals personally owned or borrowed by the writer.

Assumptions of the Study

The assumptions underlying this study were:

1. The Harper & Row Pre-Reading Test of Scholastic Ability to Determine Reading Readiness was a valid test to determine readiness in reading in grade one;

2. The Metropolitan Achievement Test, Primary Battery, Form F was a valid test for measuring achievement in third grade; and

3. The two groups were equally motivated during the first and second grades.

Hypothesis

The research hypothesis of this study was that by the end of the third grade there will be a significant difference in the academic achievement of children who attended a public school kindergarten and and the academic achievement of children who did not attend kindergarten.

DEFINITIONS OF TERMS USED

Academic Achievement

Academic achievement is knowledge attained or skills developed in the school subjects usually designated by test scores or by marks assigned by teachers.[3]

Disadvantaged Children

Disadvantaged children refers to children of the poor who suffer various social, intellectual, emotional, and physical restrictions.[4]

Intelligence

Intelligence is the ability to make successful and rapid adaptation to new situations and to learn from experience; capacity to integrate experience; as commonly used in measurement and testing, a degree of ability represented by performance or a group of tests selected because they have proven their practical value in the prediction of success in academic work in some vocations.[5]

Intelligence Quotient

Intelligence quotient is the most commonly used device for expressing level of mental development in relation to chronological

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[3]Carter V. Good (ed.), Dictionary of Education (New York: McGraw Hill Book Company, 1959), p. 7.

[4]Joe L. Frost and Glenn R. Hawkes, The Disadvantaged Child (Boston: Houghton Mifflin Company, 1966), p. 13.

[5]Good, op. cit., p. 293.

age. It is obtained by dividing the mental age (as measured by a general intelligence test) by the chronological age and multiplying by 100.[6]

Intervention

Intervention is any action on the part of an organism that serves to change the relative position of the objects or forces of the environment and of the organism itself, thus bringing new stimuli to bear upon the organism.[7]

Kindergarten

Kindergarten is an educational setup or section of a school system, devoted to the education of small children, usually from four to six years of age; characterized by organized play activities having educational, socializing values, by opportunities for self-expression and training in how to work and live together harmoniously, and by an environment, materials, curriculum, and program carefully selected to provide for child growth and development.[8]

Kindergarten Group

The group of children who attended a kindergarten class for at least nine months is referred to as the kindergarten group.

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[6] Ibid., p. 436.

[7] Ibid., p. 298.

[8] Ibid., p. 307.

Non-Kindergarten Group

The group of children who did not attend kindergarten prior to entering first grade is referred to as the non-kindergarten group.

Socioeconomic Status

Socioeconomic status is the level indicative of both the social and the economic achievement of an individual or group.[9]

ORGANIZATION OF THE STUDY

This study was divided into four chapters. Chapter 1 of the study includes a statement of the problem and its significance, the purpose, limitations, and assumptions of the study, the hypothesis, and definitions of terms pertinent to the study.

Chapter 2 presents a review of literature on early childhood education and the findings of other writers who have made similar studies.

Chapter 3 presents the procedures and the research design used to develop the study.

Chapter 4 presents an analysis of the data, findings of the study, and the summary.

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[9] Ibid., p. 510.

Chapter 2

REVIEW OF RELATED LITERATURE

The current national interest in preschool education for disadvantaged children can be traced to Friedrich Froebel. Froebel, a German educator and philosopher, organized the first kindergarten over 150 years ago. Froebel was convinced that education should serve to develop the whole child, physically, morally, and intellectually.[1]

Froebel advocated giving the child freedom of movement to explore the world and emphasized an ordered outer world which would in turn make for an ordered inner world. Froebel's use of language during the child's exploring was aimed at making the impressions of the child conscious.

In the early part of the twentieth century, Maria Montessori established a preschool program in the slum tenements of Rome. She agreed with Froebel on many of his ideas, but she replaced Froebel's material with her own, which was larger; and therefore, more manageable and easier for the child to work with and to control.[2]

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[1]Neith Headley, The Kindergarten: Its Place in the Program of Education (New York: The Center for Applied Research in Education, Inc., 1965), p. 3.

[2]Edith M. Dowley, "Perspectives on Early Childhood Education," As the Twig is Bent Readings in Early Childhood Education, eds. Robert H. Anderson and Harold G. Shane (Boston: Houghton Mifflin Company, 1971), p. 14.

Montessori believed that her individual self-guided tasks not only led to concrete learnings but stimulated the development of the child's attention. She stated that stable attention developed not from the teacher forcing passive attention upon some object through authority, but rather from the child's natural interest in objects with which he could interact in an organized way. Observation of both our middle class and culturally disadvantaged children pointed to the correctness of Montessori's claim that the young child was capable of very lengthy absorption in a task if the task was at the right developmental level for the child and if the child was not distracted by adults or other children.[3]

Bruner's theory of intellectual development stated that any subject could be taught effectively in some intellectually honest form to any child at any stage of development. The research carried on by Bruner on the intellectual development of the child indicated that at each stage of development, the child had a characteristic way of viewing the world and explaining it to himself. Bruner's general hypothesis was that any idea could be represented honestly and usefully in the thought forms of children of school age and that these first representations could later be made more powerful and precise.[4]

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[3] Lawrence Kohlberg, "Montessori with the Culturally Disadvantaged: A Cognitive Developmental Interpretation and Some Research Findings," Early Education, Current Theory, Research and Action, eds. Robert D. Hess and Roberta Bear (Chicago: Aldine Publishing Company, 1968), p. 110.

[4] Jerome Bruner, The Process of Education (Cambridge: Harvard University Press, 1960), p. 33.

The intellectual development of the child, according to Bruner, was not a clockwork sequence of events; rather, it responded to influences from the environment, notably the school environment. The growing child should be provided with problems that would tempt him into the next stage of development.[5]

Montessori stressed the fact that there was an invariant sequence or succession in the structural development of the child's mind, and that this sequence indicated that mental development was neither the direct product of maturation nor of environmental teaching but of the interaction between the structure of the organism and the structure of the environment.[6]

There has been considerable recent interest in the use of Montessori methods with culturally disadvantaged children. Montessori emphasized intrinsic motivation, sensory training, motor activities, and freedom for the child to explore and teach himself.[7]

Jean Piaget did extensive studies of intellectual development in the past three decades. His theory suggested that the child progressed through a series of stages in intellectual development. At each stage the child interacted with his environment through the processes of assimilation and accommodation, and brought new ideas into his developing intellectual schema and changed these schema as they no longer fit the information gathered. While Piaget saw these stages

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[5]Ibid., p. 39.

[6]Kohlberg, op. cit., p. 110.

[7]Ibid., p. 118.

as invariant, the rate at which children move through these stages can differ.[8] Piaget claimed that the existence of stages indicated that mental structure and development were the product of neither innate maturation nor the direct teaching of the environment, but of structural patterns of interactions between the two.[9]

According to Piaget, development was influenced by four main factors: maturation, experience, social transmission and equilibrium, or self-regulation.[10]

Montessori and Piaget were in close agreement with regard to emphasis on classification and ordering. One of Montessori's distinct features of cognitive development was her emphasis on classification and ordering. She advocated training in these operations through direct sensory experiences. Piaget identified the major cognitive advance of the preschool period as being the formation of concrete operations and their organization into logical grouping. The operation of classification, according to Piaget, represented more than the ability to discriminate perceptual sameness or difference among pairs of objects.[11]

Hunt suggested that due to a change in the concept of man's intellectual development, that there was hope for combating the inferiority of children from families of low educational and socioeconomic status by altering the conditions under which such children develop. Hunt stated that the belief in fixed intelligence was no longer tenable

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[8]Jean Piaget, The Origins of Intelligence in Children (New York: International Universities Press, Inc., 1952), p. 359.

[9]Ibid., p. 375.

[10]Ibid., p. 416.

[11]Kohlberg, op. cit., p. 114.

and that development was far from being completely determined. Hunt suggested that the existence of a change during the preschool years in the nature of intrinsic motivation was a possible means of helping the disadvantaged child. He believed that learning need not be motivated by painful stimulation, homeostatic need, or the acquired drives based upon these.[12]

Hunt stated that three stages in the development of intrinsic motivation appeared. These were characteristic of an organism's progressive relationship with any new set of circumstances and seemed to be stages in infant development only because the child encountered so many new sets of circumstances during the first two to three years.[13]

The more different visual and auditory changes the child encountered during the first stage, the more of these he would recognize with interest during the second stage. The more a child recognized during the second stage, the more of these would provide novel features to attract him during the third stage.[14]

Such development, according to Hunt, prepared the child to go on developing. It was found that most infants in families of low socioeconomic status suffer great deprivation during their first year. The effects of a lower class environment on a child's development may become even more serious during the fourth and fifth years. The longer

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[12]J. McVicker Hunt, "The Implications of Changing Ideas on How Children Develop Intellectually," Early Childhood Education Rediscovered Readings, ed. Joe L. Frost (New York: Holt, Rinehart, and Winston, 1969), p. 192.

[13]Ibid.

[14]Ibid., p. 193.

these conditions continue, the more likely the effects were to be lasting.[15]

Hunt synthesized the theories of Piaget with other studies in learning and intellectual development. Hunt emphasized that the early years of development played a significant role in providing the generalized conceptual skills needed for later learning. He further suggested the need to provide environmental enrichment activities that were matched to the child's developmental level at each stage. Hunt emphasized the importance of increasing intelligence for children through environmental manipulation and stated that early experience may be even more important for the perceptual and cognitive functions than it was for the temperamental functions.[16]

Bloom stated that the first period of elementary school (grades one to three) was probably the most crucial period available to the public schools for the development of general learning patterns. Bloom emphasized this when he said, "The absolute scale of vocabulary development and the longitudinal studies of educational achievement at grade twelve (age eighteen) has been reached by the end of grade three (age nine)."[17] Bloom stated that this was the most important growing period for academic achievement and that all subsequent learning in the school

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[15] Ibid., p. 194.

[16] J. McVicker Hunt, "The Psychological Basis for Using Preschool Enrichment as an Antidote for Cultural Deprivation," Merrill-Palmer Quarterly, X (July, 1964), 241.

[17] Benjamin S. Bloom, Stability and Change in Human Characteristics (New York: John Wiley and Sons, Inc., 1964), p. 127.

was affected and in large part determined by what the child had learned by the age of nine or by the end of grade three.[18] According to Bloom, failure to develop appropriate achievement and learning in these years was likely to lead to continuous failure throughout the remainder of school. The implications for more powerful and effective school environments in the primary school grades were obvious.[19]

As reported by Bloom, the home environment was a significant factor in determining the amount of educational growth that had already taken place before the child entered the first grade. He also stated that the home was an influencial factor during the elementary school period.[20] Bloom stated that in order for environmental manipulation to have its greatest effect on intellectual development, it must occur in the preschool years, at which time the intellectual growth was prominent.[21]

Other researchers emphasized the importance of early learning in the mental development of the young child. Bloom, Davis, and Hess stated that perceptual development takes place through the sensory modalities such as vision, hearing, touch, taste, and smell. As the child approached the formal school age of six, this development continued in more and more complex ways. Perceptual development was

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[18] Ibid., p. 110.

[19] Ibid., p. 127.

[20] Ibid., p. 128.

[21] Bloom, loc. cit.

stimulated by environments which were rich in the range of experiences available. Although differences in perceptual development were less evident by age nine, it was likely that the differences present at age six make for differences in school learning in the first years. The typical middle class home provided a very complex environment for the child's early perceptual development and this gave these children some advantage in the early years of school.[22]

Research showed that the home and early environment of the culturally deprived child produced certain deficits in perceptual skills. Middle class children received more visual discriminative experience at home and auditory discrimination of speech patterns was more highly developed.[23]

The launching of Sputnik I, in 1957, by the USSR resulted in a frantic search for reasons why American children were behind the Russians in academic achievement. The pressure for maximal utilization of our intellectual resources jolted the entire educational system and resulted in attempts to teach academic subjects to younger and younger children. Achievement began to replace adjustment as the highest goal of the American way of life.[24]

The preschool education surge produced by Sputnik required little changing of traditional practices because bright, highly

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[22]Benjamin S. Bloom, Allison Davis, and Robert Hess, Compensatory Education for Cultural Deprivation (New York: Holt, Rinehart, and Winston, Inc., 1967), p. 13.

[23]Ibid., p. 45.

[24]Dowley, op. cit., p. 17.

motivated middle class children as a group, seldom exhibit cognitive and affective deficits or inadequate learning styles which interferred with school progress. On the other hand, the progressive achievement decrement of lower class children resulting from cognitive and affective deficits required extensive retooling of objectives, curricula, and teaching strategies before adequate school progress could be made by these children.[25]

Bloom, Davis, and Hess stated that the school achievement of disadvantaged children was characterized by a cumulative deficit phenomenon. The children began school with certain inadequacies in language development, perceptual skills, attentional skills, and motivation. Under the usual school curriculum the achievement pattern of disadvantaged children was such that they fell increasingly behind their non-deprived peers in school subjects.[26]

The fact that the achievement deficit of these children was cumulative and increased over time seemed to reflect some basic weaknesses in both curriculum and school practices for these children. It appeared from the research that it was easier to overcome these deficits in the earlier years of school than later.[27]

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[25]Walter L. Hodges and Howard H. Spicker, "The Effects of Preschool Experiences on Culturally Deprived Children," The Young Child, Reviews of Research, ed. Willard W. Hartup and Nancy M. Smothergill (Washington: National Association for the Education of Young Children, 1967), p. 262.

[26]Bloom, Davis, and Hess, op. cit., p. 73.

[27]Ibid., p. 74.

According to Bloom, intelligence was a developing function and the stability of measured intelligence increased with age. In terms of intelligence measured at age seventeen about fifty percent of measurable intelligence developed between conception and the fourth year, about thirty percent between the fourth and eighth years, and about twenty percent between the eighth and seventeenth years.[28]

Deutsch stated that planned intervention programs at early periods of development of the various components of the intellectual spectrum was needed. He postulated that a child from any circumstances who had been deprived of a substantial portion of the variety of stimuli which he was maturationally capable of responding was likely to be deficient in the equipment required for school learning.[29]

Deutsch stated three progressive goals of intervention in education:

1. The first intervention goal was to prevent the cumulative deficit so that disadvantaged children would not continue to lose ground.[30]

2. The second goal was to achieve a distribution of performance among disadvantaged children similar to the national norms.

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[28]Bloom, op. cit., p. 88.

[29]Martin Deutsch, "Facilitating Development in the Preschool Child: Social and Psychological Perspectives," Merrill Palmer Quarterly, X (July, 1964), 252.

[30]Martin Deutsch, "Social Intervention and Malleability of the Child," The Disadvantaged Child, ed. Martin Deutsch and Associates (New York: Basic Books, Inc., 1967), p. 19.

3. The third goal concerned growth and utilization of intellectual potential.[31]

The national emphasis in kindergarten programs in 1965 was the disadvantaged child with cognitive and affective deficits that resulted from heredity and environmental causes. Experimental programs were set up to cope with the problems of the disadvantaged child as he entered public schools and to alleviate the progressive achievement decrement of disadvantaged children. The new emphasis toward compensatory kindergarten education came about because of the wide-spread recognition that the schools in the United States were currently failing to educate large segments of the population.[32]

The decision to utilize preschool intervention as an antidote to poverty culminated in 1965 in nationwide federally funded preschool summer programs known as Project Head Start. In the years that followed, Head Start was established as a year round program for young children.[33]

A minimum academic gain from Head Start experience was regarded to be an increase of from five to ten I. Q. points and twenty to twenty-five points on school readiness. An extensive analysis of test data was carried out for a ten percent sample of the 1965 summer Head Start

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[31]Ibid., p. 20.

[32]A. R. Jensen, "Cumulative Deficit Compensatory Education," Journal of School Psychology, IV (1966), 137-147, cited by Walter L. Hodges and Howard H. Spicker, "The Effects of Preschool Experiences on Culturally Deprived Children," Young Children, XXIII (October, 1967), 24.

[33]Dowley, op. cit., p. 18.

program in Chesapeake, Virginia. The median readiness gain of seven hundred children enrolled in programs in Virginia rose from the tenth to the twenty-eighth percentile. The number of poor risks was cut in half and the number of children with scores of average or above was more than doubled. On the post-test, twenty-seven percent of the children scored superior.[34]

Head Start's strongest public justification was that it would improve school achievement. However, research conducted on Head Start Programs found that the I. Q. gains of children who attended a Head Start Program leveled off by the end of second or third grade. Children that were enrolled for the summer achieve almost no gains and of those in the program a full year, they are soon matched by their non-Head Start classmates from similarly poor backgrounds.[35]

A study of the impact of Head Start, conducted from June 1968 through May 1969 by the Westinghouse Learning Corporation and Ohio University attempted to identify the extent to which the children now in the first, second and third grades who attended Head Start Programs are different in their intellectual, social, and personal development from comparable children who did not attend Head Start. Data were collected from tests, interviews, and questionnaires of students, parents, and teachers from 104 Head Start centers across the country and control areas.[36]

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[34] William F. Brazziel, "Two Years of Head Start," Phi Delta Kappan, XXXXVIII (March, 1967), 346.

[35] Ibid., p. 347.

[36] Westinghouse Learning Corporation and Ohio University, The Impact of Head Start: An Evaluation of the Effects of Head Start on Children's Cognitive and Affective Development (Executive Summary) (Athens: Ohio University, 1969), p. 2.

The major conclusions drawn from these data were:

1. Summer programs are ineffective in producing lasting gains in affective and cognitive development that persist in the early elementary grades.

2. Full-year programs are ineffective in aiding affective development and only marginally effective in producing lasting cognitive gains.

3. All Head Start children are still considerably below the national norms on tests of language-development and scholastic achievement while school readiness at grade one approaches the national norm.

4. Parents of Head Start children voiced a strong approval of the program.[37]

5. Programs appeared to be of greater effectiveness for certain subgroups of centers, notably in the Negro centers.[38]

It was found that Head Start children could not be said to be appreciably different from their peers in the elementary grades who did not attend Head Start in most aspects of cognitive and affective development as measured in the study.[39]

The Coleman Report, under the direction of James Coleman, also studied the Head Start Programs. The study entailed comparison between three groups, (1) Head Start participants, (2) non-participants attending the same school as participants and (3) non-participants from

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[37]Ibid., p. 7.

[38]Ibid., p. 8.

[39]Ibid.

communities where the program was not available. It was found that in most regions, Head Start participants did not attain the academic competence of their classmates in the same schools.[40] Other facts revealed from the Coleman Report were:

(1) Head Start programs were generally attended by those children from families of low socioeconomic status.

(2) Negro children had a probability of participating over five times as great as that for white children in the same region.

(3) Except for Negroes in the South in communities where Head Start programs were offered pupils who participated came from more deficient background than pupils who did not participate.

(4) Where the effects of Head Start have been found, they were most likely to occur for pupils from the poorest families. Thus, Negroes seem more likely to be helped by intervention programs more than white children, and children from low-socioeconomic backgrounds (regardless of race) were more likely to benefit from these programs than children from more affluent backgrounds.

(5) In summary, Coleman stated that Head Start programs were most effective in planting seeds of educational interest and motivation in the participants.[41]

The important question about early childhood programs is the

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[40] James S. Coleman and others, Equality of Educational Opportunity, U. S. Department of Health, Education and Welfare (Washington, 1966), p. 491.

[41] Ibid., p. 523.

value which they have in future "pay off". The main concern is whether the children do actually achieve better in school. Recent studies with longitudinal evaluation of effects help add to the information about the value of early childhood education.

The Indiana Project, reported by Spicker, Hodges, and McCandless, focused on deprived Appalachian white children, five years of age with I. Q.'s in the range of 50 to 85. The children were placed in one of four groups which contained fifteen children each. The experimental group received a structured curriculum designed to remedy specific diagnosed deficits of individual children in areas of language development, fine motor coordination, concept formation and socialization. The kindergarten contrast group, located in the same community as the experimental group remained at home and received only pre-test and post-test. A diffusion group located in communities other than the one in which the experimental group was located acted as the control for diffusion effects.

Spicker, Hodges, and McCandless reported that all groups made reliable gains from pre-test to post-test on the Stanford-Binet Intelligence test. The experimental and kindergarten contrast groups scored significantly higher than the contrast and diffusion groups.

At the end of the year of regular first grade experience the two at home groups made intellectual gains of sufficient magnitude to wash out the significant differences which had existed between the groups and the kindergarten groups.[42]

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[42]W. L. Hodges, H. H. Spicker and B. R. McCandless, "A Diagnostically Based Curriculum for Psychosocially Deprived Preschool Mentally Retarded Children," Exceptional Children, XXXIII (1966), 216.

The average gain (measured against all three control groups) after two years was 10.8 I. Q. points on the Stanford Binet Intelligence Test. The final I. Q. was 97.4 and a gain of 4.0 I. Q. points was made on the Peabody Picture Vocabulary Test. The final I. Q. was 90.4.[43]

The Perry Preschool Project at Ypsilanti, Michigan, was directed at disadvantaged Negro preschool children with I. Q.'s between 50 and 85. The program was aimed at remedying lacks largely in the verbal prerequisites for first grade learning. The selected group of children were randomly assigned to an experimental group and a control group. The groups contained twelve children each. From 1962 through 1966, new groups were constituted each year. Each of the five experimental groups received two years of nursery school prior to entering kindergarten. The control groups did not receive nursery school treatment, but participated in the testing program.[44]

In 1962, a group of four year olds was selected and divided into an experimental group of twelve children and a control group of twelve children. The experimental group had a year of nursery school before they entered kindergarten. The control group remained at home. The data for measured intelligence, based on the Stanford Binet Intelligence Test showed no significant difference between the experimental and control groups as they entered preschool, kindergarten, or first grade.[45]

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[43] Ibid., p. 217.

[44] Hodges and Spicker, op. cit., p. 266.

[45] Ibid., p. 267.

The preschool intervention program for the experimental group produced a significant gain in intellectual level that was maintained until the end of first grade. There was a significant gain of 8.9 I. Q. points in the Stanford-Binet Intelligence test after one year of preschool, but by the end of second grade, the experimental group exceeded the controls, who had had no preschool attendance, by only 1.6 I. Q. points, a non significant gain.[46]

The Early Training Project (DARCEE) was initiated in the spring of 1961 by Rupert Klaus and Susan Gray. It was designed to study the feasibility and effectiveness of conducting a preschool intervention program to offset the progressive retardation in cognitive development that characterized the culturally deprived child as he passed through school.[47]

Sixty children were selected for the demonstration project and twenty-seven children were selected in a similar neighboring community. All children were expected to enter school in the fall of 1964. The children were assigned to three groups. One training group participated in a ten week summer school session during 1962, 1963, and 1964. A second training group participated in the ten week summer sessions in 1963 and 1964. The third Murfreesboro group served as the local control group and the one in the neighboring community served as the distal control group.[48]

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[46]Ibid.

[47]Rupert Z. Klaus and Susan W. Gray, "Murfreesboro Preschool Program for Culturally Deprived," Childhood Education, XLII (October, 1965), 92.

[48]Ibid., p. 93.

A report at the end of fourth grade showed that the experimental children remained significantly superior to the control children on intelligence tests. On measures of language and achievement, trends still remained, but differences were no longer significant by the end of fourth grade. There was a slight but parallel decline across groups.[49]

Data results, as reported by Hodges and Spicker, on the academic achievement of children who were the subjects in experimental intervention projects described in the preceding paragraphs were as follows:

1. The experimental children were able to profit from the first two years of school. Control children who were not exposed to the special preschool did not appear to profit from school at all.[50]

2. Achievement testing results reported that the two combined experimental groups for the Early Training Project were significantly better than the two combined control groups on The Metropolitan Achievement Test subtests of Word Knowledge, Reading, and Arithmetic, and on the Stanford Achievement Subtests of Word Reading, Paragraph Meaning, Work Study Skills, and Arithmetic, at the end of second grade.

3. At the beginning of second grade, the mean I. Q.'s of the experimental groups were 98.1 and 99.7 while those of the control groups were 91.4 and 89.4. Even though the control groups were similar on I. Q. at this point and significantly below the I. Q. level of the

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[49]Rupert Klaus and Susan Gray, "The Early Training Project: A Seventh Year Report," Child Development, ed. Betty Caldwell, XLI (December, 1970), 922.

[50]Hodges and Spicker, op. cit., p. 283.

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experimental group, there are a number of achievement differences which favor the local control group.[51]

4. The local control group performed significantly better than the distal group on the Arithmetic subtest of the Metropolitan Achievement Test and on Word Reading, Paragraph Meaning, Work Study Skills, and Arithmetic of the Stanford Achievement Tests. In all other subtest comparisons at the end of second grade, the local controls performed relatively, but not significantly higher than the distal controls.

5. At the end of the second grade, neither the Perry Preschool Project, nor the Early Training Project experimental children were performing as well as advocates of preschool training for culturally deprived children had hoped.

6. None of the experimental groups, or the local control group of the Early Training Project were performing as poorly as might have been predicted without intervention.[52]

The well-known Bereiter-Englemann program at the University of Illinois was aimed at teaching specific cognitive skills, particularly of a logical, semantic nature. The emphasis was on information processing skills considered essential for school learning. It was academically oriented with twenty minutes each day of intensive instruction in the three major content areas--language, reading, and arithmetic. The pre-post test gains (not measured against a control

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[51] Ibid., p. 284.

[52] Ibid., p. 285.

group) for the Stanford-Binet Intelligence Test over an eighteen months period were eight to ten points.[53]

According to Bereiter and Englemann, the children's I. Q.'s were remarkably low for children who performed at the academic level actually attained in the program. Their scholastic performance was commensurate with that of children ten or twenty points higher on I. Q. Such was the advantage of a highly focused training--it could significantly boost the basic skills that count most. An important point brought out by the Bereiter-Englemann program was that it showed that scholastic performance could be boosted much more at least, in the early years, than can the I. Q., and that highly concentrated, direct instruction is more effective than more diffuse cultural enrichment.[54]

At the end of both first and second grades, the experimental group achieved significantly greater Stanford-Binet I. Q. gains than the subjects in the comparison program. The experimental group showed a 10 point gain after the first year and an 8.6 gain after the second year. For the experimental group the mean reading achievement was grade level 2.6 and the mean for arithmetic performance was 1.87. The mean spelling performance was 1.87.[55]

Sprigle, Van de Riet, and Van de Riet developed a specialized curriculum which included a series of developmental tasks that emphasized manipulating, organizing, classifying and ordering things that lead to internalized thought and effective verbal expression.

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[53]Carl Bereiter and Siegfried Englemann, Teaching Disadvantaged Children in the Preschool (New Jersey: Prentice-Hall, 1966), p. 52.

[54]Ibid., p. 53.

[55]Ibid., p. 54.

The subjects used in the study consisted of seventy-two culturally deprived Southern Negro, five-year old children. The children were assigned to one of the three groups of twenty-four. They were matched by socioeconomic level, age, sex, school readiness skills, and intelligence. The experimental group received one school year of the sequential learning curriculum; a kindergarten control group received a traditional nursery-kindergarten curriculum and an at home control group received only the pre- and post-testing.[56]

Although all three groups were comparable on the Stanford-Binet Intelligence Test prior to treatment (the mean I. Q. for all groups was approximately 90), the post-test results indicated that the mean I. Q. for the experimental group had remained unchanged, while the mean I. Q. of the home control group had decreased by approximately seven points. All differences between groups were highly significant. Since the magnitude of the differences among groups was greater than any reported in the literature, the investigators hypothesized that a further contributing factor to the success of the intervention program might have been a difference in teacher effectiveness in favor of the experimental group.[57]

According to Bereiter and Englemann the magnitude of I. Q. and scholastic achievement gains resulting from cognitive stimulation programs authentically ranged between about five and twenty points

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[56] N. A. Sprigle, V. Van de Riet, and Hani Van de Riet, "A Sequential Learning Program for Preschool Children and An Evaluation of Its Effectiveness with Culturally Disadvantaged Children" (Paper read at American Education Research Association, March, 1967, New York).

[57] Ibid.

for I. Q.'s and between one-half and two standard deviations for specific achievement measures.

The evidence from studies suggested that the payoff of preschool and compensatory programs in terms of I. Q. gains is small. Greater gains were possible in school performance when instructional techniques were intensive and highly focused, as in the Berieter-Englemann Program.[58]

Bereiter and Englemann summarized the findings of experimental preschool classes for the disadvantaged with the following statement:

> On the average, disadvantaged children who have gone through a preschool will progress half the way from their initial I. Q. level to the normal level of 100. These few cases where the disadvantaged groups have risen to an I. Q. level of 100 or above through preschool training have all involved radical departure from the traditional preschool model.[59]

Deutsch stated that in order to assure stability of progress of children who had been in preschool programs it was desirable to continue special programs for several years. The construction of a preschool program did not absolve a community or a school system from the responsibility to construct an effective strategy for teaching the marginal youngsters from kindergarten on. Deutsch further stated that if there was to be a reversal of some of the sequalae associated with poverty programs they must have continuity, at least through the early primary grades.[60]

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[58] Bereiter and Englemann, op. cit., p. 54.

[59] Ibid., p. 16.

[60] Martin Deutsch, op. cit., p. 260.

Pitts compared the social growth, emotional development, academic readiness, and general readiness of kindergarten children with varying amounts of pre-kindergarten formal school experience. A group of eighty-seven kindergarten children matched according to age, sex, birthplace, and ethnic background were divided into three experimental groups. One group had participated in a nine-month preschool program and the second in an eight-week summer program, and the third had no formal antecedent school experience. Pitts found that the length of preschool attendance was positively related to facilitating such dimensions of social growth as cooperation, independence and dependability, but was not related to the academic readiness or the total readiness of the groups studied. Differences, though not significant, were in favor of the longer period of attendance.[61]

Mindness and Keliher cited a study by Bonney that reviewed the research related to the advantages of kindergarten. In the study there was increasing evidence to support the assumption that "rich experience enhanced a child's intellectual activity, self-assurance, social skill, and hence the potential for academic achievement.[62]

Myers reported a study of the grades and ratings of eighty-eight

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[61]Vera L. Pitts, "An Investigation of the Relationships Between Two Preschool Programs on the Adjustment and Readiness of Disadvantaged Pupils," Childhood Education, XLIV (April, 1968), 525.

[62]Mary Mindness and Alice V. Keliher, "Reviews of Research Related to the Advantages of Kindergarten," Childhood Education (Washington, D.C.: Association for Childhood International), XLIII (May, 1967), 511.

first grade pupils over a period of one year. Forty-four of the pupils received approximately one year of kindergarten training. The other forty-four had not attended kindergarten. The results indicated that the kindergarten group did decidedly better than the non-kindergartners in the first grade, both as to progress in subject matter and the ability to adjust themselves to school conditions.[63]

Results of the kindergarten program of Blacksburg Elementary School, South Carolina, in June 1950, were stated by J. K. East. Data were obtained from the Metropolitan Achievement Test which were given to first grade pupils. The median grade placement for the kindergarten pupils was four months more advanced than that of the non-kindergarten pupils. The greatest difference in achievement was in word meaning. Numbers seemed to trouble non-kindergarten pupils least. In all areas the kindergarten pupils excelled as a group. The greatest difference in achievement between kindergarten and non-kindergarten pupils was in word meaning. Value of kindergarten was further shown by a comparison of the median grade placement on the Metropolitan Achievement Test of non-kindergarten children and kindergarten children. The 1950 first grade placement on the Metropolitan Achievement Test was 1.7--these pupils had not attended kindergarten. The 1951 placement on the same test was 2.1. Thirty-eight out of fifty-two, 1951 first graders had attended kindergarten.[64]

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[63]Vest Myers, "Is It Worthwhile to Send Your Child to Kindergarten?" Educational Method, XV (April, 1936), 389.

[64]J. K. East, "Kindergarten is a Good Investment," The School Executive (May, 1953), pp. 52-53.

A study of Negro urban disadvantaged children in New York Public School kindergartens was a part of a larger project, called the CRAFT Project. Results for the kindergarten study were based on tests taken by those children who had attended kindergarten for a minimum of one-hundred and one days, and for those children who did not attend kindergarten at all. The Stanford Achievement Test was administered at the end of grade two. At the end of grade three, the population included three-hundred kindergarten children and one-hundred and fourteen children without kindergarten experience.

At the end of the first grade, twenty-one grade equivalent comparisons were made and all comparisons but one favored the kindergarten group. By the end of the second grade, the children who had kindergarten experience did better than the children who did not on eleven of the fourteen comparisons and nine of these were significant. On most of these comparisons kindergarten children averaged two months higher than non-kindergarten children. At the end of the third year there were only four significant differences among the fourteen comparisons made and all four favored children with kindergarten experience.[65]

DiLorenzo and Salter studied the effectiveness of an academic year preschool program for the disadvantaged. The longitudinal study extended from kindergarten through second grade. The project was conducted in eight school districts whose basic curriculum emphasized

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[65]Coleman Morrison and Albert J. Harris, "Effect of Kindergarten on the Reading of Disadvantaged," The Reading Teacher, XXII (October, 1968), 5.

language and cognitive development, but varied in comprehensiveness and methods of reading readiness instruction.

At the end of the first two years of study, the kindergarten experience had proven beneficial for the subjects. The most effective kindergarten programs were those that had the most specific structured cognitive activities.[66]

Dinkmeyer reported that internal forces such as maturation and readiness must precede many types of learning if they are to be most effective. Achievement was found to have a direct relationship to development. There is no research evidence to indicate that progress can be forced or hastened and produce permanent gain, except in instances of environmental deprivation.[67]

Each child is a unique human being different in rate of growth and development, therefore, he is different in achievement. As a child matures and comes into contact with various educational experiences his concept of self as an achiever is being formulated. Dinkmeyer reported that no research indicated that progress could be forced or hastened, and produce permanent gain, except in instances of environmental deprivation. Generally force and pressure were found to be detrimental influences on the learning process.[68]

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[66]Louis T. DiLorenzo, "Effects of A Year Long Pre-Kindergarten Program on Intelligence and Language of Educationally Disadvantaged Children," The Journal of Experimental Education, XXXVI (Spring, 1968), 36-42.

[67]Don C. Dinkmeyer, Child Development, The Emerging Self (New Jersey: Prentice Hall, Inc., 1965), p. 342.

[68]Ibid., p. 346.

Dinkmeyer reported that educational achievement of any child was a product of growth forces within and experiences provided for him by the environment, home, and school. As a child matured and came in contact with various educational experiences his concept of self--as an achiever was formulated.[69]

Evidence from the Coleman Report suggested that variation in the facilities and curricula of the schools account for relatively little variation in pupil achievement insofar as this was measured by standard tests. The Coleman Report revealed that home conditions, general conditions of life and educational backgrounds and aspirations of the other students in the schools were more important predictors of school achievement than any of the variables that were studied.[70]

According to Lucco, it was necessary to call attention to the predictably limited effectiveness intervention programs can have and the eventual failure of such programs with many children when evaluated on the basis of performance in upper elementary grades and beyond. From the standpoint of cognitive development: (1) It continues to develop after age five. (2) Particular environmental components are vitally important to each stage of that development. (3) Enrichment cannot be utilized if it is beyond the maturational range of the organism at the time.[71]

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[69]Ibid., p. 342.

[70]Coleman, op. cit., p. 290.

[71]Alfred Lucco, "Cognitive Development After Age Five: A Future Factor in the Failure of Early Intervention with the Urban Child," American Journal of Orthopsychiatry, XLI (March, 1971), 317-318.

Nimnicht, Johnson, and Johnson recommended a set of heuristic notions to replace the notions of compensatory education and intervention for deprived children. These notions were of the parents' or family's ability to attend to a child (ATA) and the schools' ability to respond to a child (ATR). They emphasized that these notions were more realistic and focused in such a way that education could cope with the problems of the deprived child with more success than the previously compensatory and intervention programs.[72]

Under the notion of ATA, the first concern was the ability of the parents or family to attend to a child's physical needs by providing adequate care of an expectant mother and adequate food, shelter and health care for the child. They pointed out that lack of adult attention seemed to be one of the major factors in environmental deprivation so the second concern becomes those variables in the environment that can reduce the parents' ability to attend to an individual child because they drain off the time and energy of the adults. By providing adults with the time to attend to their children, environmental conditions should be improved.[73]

The ATA was concerned with providing every child with an environment that could attend to his needs to the extent of insuring that he was not physically, psychologically or intellectually stunted.

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[72]Glen P. Nimnicht, James A. Johnson Jr., and Patricia A. Johnson, "The Time for a New Set of Directions for Head Start and Other Intervention Programs is Overdue" (Berkeley: Far West Laboratory for Educational Research and Development, 1972).

[73]Ibid., p. 27.

This does not mean that every child would have the same kind of environment or the same quality of environment but that the minimal essentials of health, physical needs, and time for people to attend to his development would be present.

The notion of the schools' ability to respond (ATR) emphasized that the school should recognize that children from different backgrounds bring different strengths to school and learn to respond to a child without attaching negative values to what he has or has not learned before he comes to school. A non-middle class child has learned and is learning some of the skills and abilities that the school cannot teach and these may prove to be extremely important in his future.

The basic problem with the present system, according to Nimnicht, Johnson, and Johnson is that schools are designed to serve white middle-class students who hold the same values as the teachers--or other children who want to be like white middle-class children. The schools respond to these children and nurture their development, but they do not recognize skills and abilities that are vital in the environment of the deprived child. They suggested that it was not unreasonable for the schools to recognize their own limitations and modify curricula and procedures to become more responsive to deprived children.[74]

Both the concepts of ATA and ATR are still in the conceptual stages, but they do suggest an approach to the problem of helping

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[74]Ibid., p. 30.

deprived children that appear to be more promising than compensatory or intervention programs which have been tried in the past. Nimnicht, Johnson, and Johnson stressed that it was important for the policy-makers and educators to adopt a new set of ideas to replace the concepts of compensatory education and intervention, and through these they believe that the schools can be more successful with the deprived child than they have been.[75]

Summary

The review of related literature reported theories of early childhood educators. It also reported the intervention programs which were designed to alleviate the cumulative deficit of disadvantaged children. The programs that were reviewed included the Head Start Project, the Indiana Project, the Perry Preschool Project, the Early Training Project (DARCEE) and the Bereiter and Englemann Project. Results of the Westinghouse Study, the Coleman Report and individual research studies were reported.

In review of such programs, there was evidence that intervention programs especially designed to remedy cognitive deficits during the preschool years and to prevent progressive school failure during the later school years have been relatively effective.

The evidence also suggested that the pay off of intervention programs in terms of I. Q. gains was small. Greater gains were possible in school performance when instructional techniques were intensive and highly focused.

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[75]Ibid., p. 44.

Chapter 3

PROCEDURES AND DESIGN OF THE STUDY

The purpose of this study was to compare the academic achievement of a group of children who had attended a public school kindergarten in a rural Appalachian area with a similar selected group of children in the same area who had not attended public school kindergarten. The study focused on the achievement of the selected groups for a three year period, from the fall of 1968 through the spring of 1972.

PROCEDURES

At the school in which the study was carried on, the aid of the principal and the third grade teachers was secured. The cumulative records of the selected groups of children were used for the collection of data.

The first task was to locate the children who had attended the first public school, state-supported kindergarten class in the Washington County School System in the fall of 1968 through the spring of 1969. In order to find out who these children were and how many were still in the King Springs School, the third grade cumulative records at the school were checked. Out of the original twenty-five kindergarten children in that first kindergarten class, only fourteen remained in the school. Twelve of these students were selected for the kindergarten group.

The criteria used for the selection of the kindergarten group were:

(1) They attended the first public school kindergarten in the Washington County School System, at King Springs School in 1968-1969.

(2) They attended school in the Washington County School System, King Springs School for three consecutive years.

(3) They entered the first grade in the fall of 1969.

(4) They were approximately 9.6 years old.

Data were recorded from the cumulative records of twelve students who had attended the first public school kindergarten in the Washington County Schools.

Selection of the Non-kindergarten Group

The selection of the non-kindergarten group was done by random sampling of the students remaining in the third grade.

The criteria used for the selection of the non-kindergarten group were:

(1) They had not attended public school kindergarten.

(2) They entered first grade in the fall of 1969.

(3) They had been enrolled in King Springs School for three consecutive years.

(4) They were approximately 9.6 years old.

Data were recorded from the cumulative records of the twelve students who had not attended a public school kindergarten.

Data collected for this study included scores on tests administered by the public school system during the three year period the study covers. The tests were: (1) The Harper & Row Pre-Reading Test

of Scholastic Ability to Determine Reading Readiness, and (2) The Metropolitan Achievement Test, Primary Battery, Form F. These scores were tabulated and prepared for a statistical analysis of the data using the IBM at the computer center on the campus of East Tennessee State University.

DESIGN OF THE STUDY

The design of the study included the selection of kindergarten subjects who had attended the King Springs kindergarten during the 1968 through 1969 school year. The non-kindergarten subjects were randomly selected from the remaining third graders at King Springs School, a small rural school in the Appalachians. The design of the study included securing and analyzing test scores from the records of these children over the three year period in an effort to discern the effect of the first public school kindergarten program in the Washington County School System.

Population

The sample was drawn from a population of rural white Appalachian children. The sample of the study included a kindergarten group of twelve subjects who had attended the first public school kindergarten in a rural school in Appalachia and a non-kindergarten group of twelve subjects who had not attended a public school kindergarten. The criteria for selection of these groups were:

(1) They entered first grade in the fall of 1969.

(2) They had been in the same school for three consecutive years.

(3) They were approximately the same age.

The total sample included twenty-four children. It included six boys and six girls in the kindergarten group and six boys and six girls in the non-kindergarten group.

DATA AND INSTRUMENTATION

Instruments used to gather data were the Harper & Row Pre-Reading Test of Scholastic Ability to Determine Reading Readiness and The Metropolitan Achievement Test, Primary Battery, Form F. The data were recorded for a three year period, 1969 through 1972. These measures were chosen because they were the tests administered by the school system. The study was limited to intellectual development as measured through achievement and readiness.

The following research hypothesis was stated:

The research hypothesis of this study was that by the end of the third grade there will be a significant difference in the academic achievement of children who attended a public school kindergarten and the academic achievement of children who did not attend kindergarten.

The following statistical hypothesis was stated:

There will be no significant difference between the mean score achievement of the group who attended the kindergarten program and the group who had no kindergarten experience prior to first grade.

PLAN FOR ANALYSIS

A statistical analysis of the data using the IBM 1130 at the East Tennessee State University Campus was planned. An analysis of covariance was performed on the data. The main mode of analysis was

finding the difference between these two groups using these two instruments: The Harper & Row Pre-Reading Test of Scholastic Ability to Determine Reading Readiness and The Metropolitan Achievement Test.

METHOD OF ANALYSIS

The first grade test scores were used as the covariant or dependent variable in the analysis of covariance and the third grade test was used as the variant or independent variable. The method of analysis consisted of programming the data for the IBM 1130 Computer. The mean scores for the kindergarten and non-kindergarten groups for the two tests were reported with the analysis of covariance testing for significant difference between the means of the scores.

The statistical hypothesis stated that there was no significant difference between the mean score achievement of the group who attended a kindergarten program and the group who had no kindergarten experience prior to first grade.

SUMMARY

In Chapter 3, the design of the study and procedures were presented in a comparison of the academic achievement of a group of children who had attended a public school kindergarten with a similar group who had not attended a public school kindergarten. The study covered a three year period.

The data and instrumentation to support the null hypothesis, "There will be no significant difference between the mean score achievement of the group who attended the kindergarten program and the group who had no kindergarten experience prior to first grade" was

reported. The plan and method of analysis used to achieve the purpose of the study, to compare the academic achievement of children who attended the public school kindergarten with those who did not attend a public school kindergarten was described.

Chapter 4

THE PRESENTATION AND ANALYSIS OF DATA

An analysis of covariance was used as the statistical procedure to test the null hypothesis which stated that there was no significant difference between the mean score achievement of the group who attended the kindergarten program and the group who had no kindergarten experience prior to first grade. An analysis of covariance leads to a test for difference in the means by separation of a sum of squares into several portions. In this case, test for a difference in the means of the residuals, which are the differences of the actual observations and a regression quantity based on the associated second variable, was used.

The analysis of covariance was chosen as a means of statistical analysis of the data since the two groups of children being tested were not equal. In this study, it was necessary for these groups to be studied in tact. The subjects were not matched on any factors. The covariant analysis lends itself to analysis by statistically controlling for the difference in the two groups.

The variables used were the scores from the first grade test and the scores from the third grade test. The X variable (first grade test) served as the controlled or adjusted variable, known as the covariant. The Y variable (third grade test) served as the independent variable or variant.

The sum of X and Y and the mean scores of X and Y of groups A and B are reported in Table 1.

Table 1 indicates that the mean scores on achievement for the X variable for the groups placed the kindergarten group 10.250 points above the non-kindergarten group. This agreed with other similar studies that reported the greatest gains made by disadvantaged children in intervention programs was their initial contact with school.

The mean scores on achievement for the Y variable for the two groups again placed the kindergarten group above the non-kindergarten group by 1.916 points. This also agrees with studies on similar intervention programs that by the end of the second and third grades, the gains made by children who attended intervention programs leveled off and children who did not attend intervention programs appeared to catch up.

Table 2 contains the analysis of covariance for the two groups, including the source of variation within each group, within groups, among means, the degrees of freedom, and the F-ratio.

The data presented in Table 2 reflects the results of the analysis of covariance testing for significant difference between the means of the total scores on the Harper & Row Pre-Reading Test of Scholastic Ability to Determine Reading Readiness and The Metropolitan Achievement Test, Form F of each of the two groups. The result of the analysis of covariance using degrees of freedom 1/21 revealed a F-ratio of 1.44 which was less than the needed value of 4.32 at the 0.05 level of significance. Therefore, in the analysis of the F-ratio as a test for difference between the means, there was no significant difference between groups A and B and the test failed to reject the null

Table 1

Sums of Variables and Mean Scores

GROUPS	Variables				
	N	Sum of X	Mean of X	Sum of Y	Mean of Y
A (non-kingergarten)	12	1151.000	$\bar{X}$=95.91667	579.000	$\bar{X}$=48.2500
B (kindergarten)	12	1274.000	$\bar{X}$=106.1666	614.000	$\bar{X}$=51.1666
Total	24	2425.000		1193.000	
Difference in mean scores			10.250		1.916

Table 2

Analysis of Covariance

Source of Variation	d.P.	Sums of Squares of X	Sums of Squares of Y	Sums of Cross-Products	Sums of Squares of Residuals	F
Within each group						
A (Non-kindergarten)	11	4580.917	438.2500	-217.7500	427.8994	
B (Kindergarten)	11	3761.666	663.667	-348.3333	631.4107	
Among Means	1	630.3648	51.03650	179.3699	.00308013	
Within Groups	21	8342.584	1101.916	-566.0833	1063.505	1.44*
Total	22	8972.947	1152.953	-386.7134	1136.286	

*$p < 0.05$

hypothesis at the 0.05 level of significance. The null hypothesis of this study stated that there was no significant difference between the mean score achievement of the group who attended the kindergarten program and the group who had no kindergarten experience prior to first grade. Therefore, the null hypothesis was accepted.

SUMMARY AND CONCLUSIONS

The first public school kindergarten in the Washington County School System enabled children from disadvantaged groups to achieve on par with other children in the school. Evidence from analysis of covariance revealed that at both the first grade and the third grade, the kindergarten group placed above the non-kindergarten group in difference in means. The children in the first kindergarten were primed for first grade, showing a higher mean on the first grade test than the group who did not attend kindergarten. A higher mean on the third grade test was revealed for the kindergarten group. However, there was no significant difference at the 0.05 level of significance between the two groups. The null hypothesis of this study was accepted.

There was no indication of the third grade slump as had been reported in other studies, however, there was evidence that by third grade the non-kindergarten group was catching up with the kindergarten group. It was concluded that the kindergarten program was a success in priming the disadvantaged children, and providing experiences which enabled them to achieve higher in the first and third grades than the children who did not attend the kindergarten program. It was also concluded that the educational programs carried on in the primary

grades at the King Springs School was of such caliber that the children in the kindergarten group maintained their gains through third grade.

RECOMMENDATIONS

In order to investigate more fully the academic achievement of children who attended a kindergarten program and children who did not attend a kindergarten program, more thorough and exhaustive research is needed. The following recommendations are made on the basis of the results of this study:

(1) Further investigations should include a larger population representing both the kindergarten and non-kindergarten groups.

(2) There is a need for analyzing collected data according to sex, so that a clearer indication of the academic achievement of both boys and girls could be shown.

(3) Pupils should be tested at regular intervals throughout the year to obtain the achievement of each pupil and compare progress in all areas.

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